# Learning Resource

# Fitness Testing

## 42 pages

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## Area of content and knowledge covered by this study unit: -

- A general outline of the different kinds of fitness relevant to sport performance.
- How these fitness components may be tested.
- How to undertake tests so that they are accurate, valid and reliable
- An identification of which fitness components and tests may be relevant to the individual student as a performer
- Whether any of the fitness components show a statistical relationship.
- To begin to be able to make judgements about the relative fitness of themselves and others.
- To gather evidence to enable the planning for performance improvement.

# Fitness Testing - WHY?

- **To determine individual strengths & weaknesses**
- **To establish a base from which to determine training loads**
- **To enable an evaluation of fitness improvement**
- **Measured improvement can be a great motivator**

# Validity & Reliability

- Fitness tests must be; **valid** eg

They actually test what they set out to test

- Fitness tests must be; **reliable**

If you repeat the test under the same conditions you will obtain a similar result

# Achieving Reliability & Validity

- Write/use a test procedure (protocol) and stick to it

- Take accurate measurements, measuring the same way for each subject

- Make the test specific as possible to the type of fitness you wish to test

- What other variables may be affecting your result?

# Notes for Supervisors

**Advisory notes on the use of students in the measurement and testing of physical performance**

These notes are an attempt to review the information currently available on the subject of what is considered to be good and safe professional practice in carrying out the tests outlined in this pack.

They do not themselves constitute a definitive analysis or recommendation of safe practice.

It would appear that there is no clear policy relating specifically to such non-invasive, non-therapeutic physical tests as described here. However, tests involving human subjects must only be carried out under the supervision of a suitably qualified and responsible person. Supervisors of such tests do have a clear responsibility and legal obligation to take care of the health and safety of any person who may be affected by their acts or omissions. Codes of Safe Practice in educational establishments may vary from area to area, and from institution to institution, and the Supervisor has a duty to be aware of the relevant Health and Safety requirements.

All teachers are expected to exercise the same care for their students as would any reasonably careful parent when looking after her/his own children.

The exercise involved in the tests outlined here does not exceed that normally undertaken in supervised School/College physical education activities. The difference lies in the actual measuring techniques, which should only be undertaken by a suitably qualified member of staff, with a full understanding of the procedures involved. ...Continued

# Treadmill & Cycle Ergometer Testing of Physical Performance

25 pages

## INTRODUCTION

THIS IS NOT A GUIDE TO THE PROTOCOLS OF THESE TESTS BUT PRESENTS THE RESULTS OF SUCH TESTS FOR ANALYSIS AND INTERPRETATION FOR THE INSIGHTS THEY PROVIDE INTO EXERCISE PHYSIOLOGY

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Note some questions refer to the protocols used in these tests. These are highlighted in blue and can be ignored if the student is not familiar with them.

# 1. Breathing Rates & Volumes

**Figure 1:** Normal Tidal Breathing trace.
Tidal volume and ventilation rate can be determined at rest and after exercise, and the minute volume or minute ventilation or respiratory minute volume, can be calculated, i.e.tidal volume multiplied by ventilation rate per minute (from 8 $dm^3$ at rest to 100 $dm^3$ during exercise).

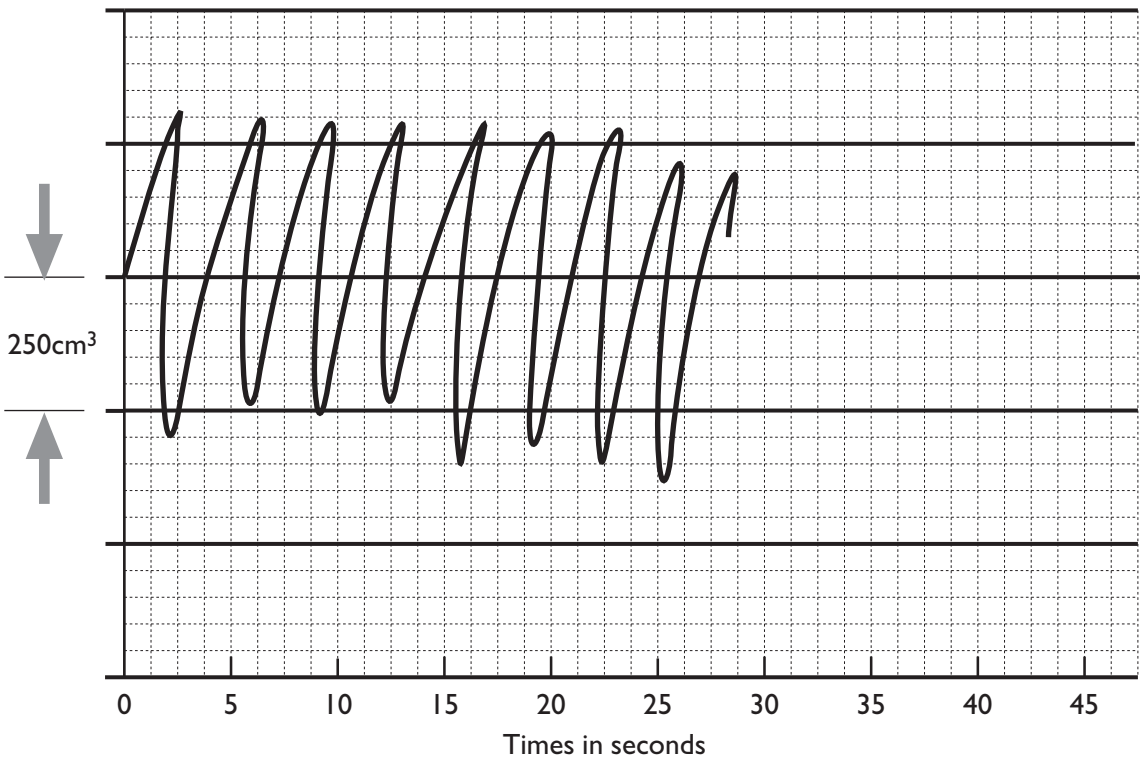

**Figure 2:** Vital Capacity Trace. The vital capacity is determined by taking a maximum inspiration then exhaling as hard and completely as possible, this can also be referred to as the Forced Vital Capacity (FVC). The FEV1 is the percentage of the vital capacity exhaled in one second, normally about 85% in an adult. The maximum voluntary ventilation is the volume of air that can be breathed in 15 seconds of forced rapid and deep breathing multiplied by 4 to give a figure for one minute (in average adult males about 150 $dm^3$, and in average adult females about 95 $dm^3$). Indirect methods indicate that the total lung capacity is approximately six times the expiratory reserve volume.